



AFCTN Test Report 94-058

AFCTB-ID
94-005



Technical Graphics Transfer

Using:



International TechneGroup
Incorporated's Data

MIL-D-28003 (CGM)

Quick Short Test Report

15 February 1994



Prepared for
Electronic Systems Center
Det 2 HQ ESC/AV-2
4027 Colonel Glenn Hwy, Suite 300
Dayton, Ohio 45431-1672

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International TechneGroup Incorporated's Data

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Quick Short Test Report

15 February 1994

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Air Force CALS Test Bed

Notification of Test Results

15 February 1994

This notice documents the results of an Air Force CALS Test Bed (AFCTB) Quick Short Test Report (QSTR) evaluation of data submitted by:

International TechneGroup, Inc.

Identified as follows:

Title:	MIL-D-28003 CALS Compliance
Program:	ITI Translator Development Program
Program Office:	International TechneGroup, Inc.
Contract No.:	N/A
QSTR No.:	AFCTB-ID 94-005

Received on the following media: **Internet**

The results of the AFCTB Quick Short Test Report evaluation are as follows:

MIL-STD-1840A Media Format:	N/A
MIL-D-28000A IGES:	N/A
MIL-M-28001A SGML:	N/A
MIL-R-28002A Raster:	N/A
MIL-D-28003 CGM:	Pass

Formal results with associated disclaimer are documented and available from the AFCTB.

**Air Force CALS Test Bed
HQ ESC/AV-2P
4027 Colonel Glenn Highway, Suite 300
Dayton, OH 45431-1672
Phone: 513-257-3085 FAX: 513-257-5881**

Contents

1.	Introduction.....	1
1.1.	Background.....	1
1.2.	Purpose.....	2
2.	Test Parameters.....	3
3.	1840A Analysis.....	5
3.1.	External Packaging.....	5
3.2.	Transmission Envelope.....	5
3.2.1.	Tape Formats.....	5
3.2.2.	Declaration and Header Fields.....	5
4.	IGES Analysis.....	5
5.	SGML Analysis.....	5
6.	Raster Analysis.....	6
7.	CGM Analysis.....	6
8.	Conclusions and Recommendations.....	9
9.	Appendix A - Detailed CGM Analysis.....	10
9.1.	File ITIMECH.CAL.....	10
9.1.1.	Parser Log MetaCheck.....	10
9.1.2.	validcgm Log.....	12
9.1.3.	Output cgm2draw/IslandDraw.....	13
9.1.4.	Output CADLeaf.....	14
9.1.5.	Output Generic.....	15
9.1.6.	Output Designer.....	16

9.1.7.	Output Freelance	17
9.1.8.	Output Harvard Graphics.....	18
9.1.9.	Output IslandDraw v4.0.....	19
9.1.10.	Output Ventura Publisher.....	20
9.2.	File ITIMECH.ANS.....	21
9.2.1.	Parser Log MetaCheck.....	21
9.2.2.	validcgm Log.....	22
9.3.	File ITITORUS.CAL.....	23
9.3.1.	Parser Log MetaCheck.....	23
9.3.2.	validcgm Log.....	24
9.3.3.	Output cgm2draw/IslandDraw.....	25
9.3.4.	Output CADLeaf.....	26
9.3.5.	Output Generic.....	27
9.3.6.	Output Designer.....	28
9.3.7.	Output Freelance	29
9.3.8.	Output Harvard Graphics.....	30
9.3.9.	Output IslandDraw v4.0.....	31
9.3.10.	Output Ventura Publisher.....	32
9.4.	File ITITORUS.ANS.....	33
9.4.1.	Parser Log MetaCheck.....	33
9.4.2.	validcgm Log.....	34

1. Introduction

1.1 Background

The Department of Defense (DoD) Air Force Continuous Acquisition and Life-cycle Support (CALS) Test Network (AFCTN) is conducting tests of the military standard for the Automated Interchange of Technical Information, MIL-STD-1840A, and its companion suite of military specifications. The AFCTN is a DoD sponsored confederation of voluntary participants from industry and government managed by the Electronic Systems Center (ESC).

The primary objective of the AFCTN is to evaluate the effectiveness of the CALS standards for technical data interchange and to demonstrate the technical capabilities and operational suitability of those standards. Two general categories of tests are performed to evaluate the standards; formal and informal.

Formal tests are large and comprehensive, which follow a written test plan, require specific authorization from the DoD, and may take months to prepare, execute, and report.

Informal tests are quick and short, used by the AFCTN technical staff, to broaden the testing base. They include representative samples of the many systems and applications used by AFCTN participants. They also allow the AFCTN staff to gain feedback from many industry and government interpretations of the standards, to increase the base of participation in the CALS initiative, and respond to the many requests for help that come from participants. Participants take part voluntarily, benefit by receiving an evaluation of their latest implementation (interpretation) of the standards, interact with the AFCTN technical staff, gain experience using the standards, and develop increased confidence in them. The results of informal tests are reported in Quick Short Test Reports (QSTRs) that briefly summarize the standard(s) tested, the hardware and software used, the nature of the test, and the results.

1.2 Purpose

The purpose of the informal test, reported in this QSTR, was to analyze International TechneGroup Incorporated's (ITI) interpretation and use of the CALS standards, in transferring technical illustration data. ITI used its CALS Technical Data Interchange System to produce CGM data, in accordance with the standards, and delivered it to the AFCTN technical staff using an electronic transfer.

The stated purpose of this test is to evaluate the CGM translator output files. Both CALS and ANSI standard CGM files were provided. No MIL-STD-1840A evaluation will be made.

2. Test Parameters

Test Plan: AFCTB 94-005

Date of
Evaluation: 15 February 1994

Evaluator: George Elwood
Air Force CALS Test Bed
DET 2 HQ ESC/AV-2P
4027 Colonel Glenn Hwy
Suite 300
Dayton OH 45431-1672

Data
Originator: JMM
International TechneGroup Incorporated
5303 DuPont Circle
Milford OH 45150
(513) 576-3900

Data
Description: Technical Graphics Test
4 Computer Graphics Metafile (CGM) files

Data
Source System: CGM

HARDWARE
Unknown

SOFTWARE
Unknown

Evaluation Tools Used:

MIL-D-28003 (CGM)
SUN SparcStation 2
ArborText *cgm2draw*
Carberry *CADLeaf Plus v3.1*
Island Graphics *IslandDraw v3.0*
Island Graphics *IslandDraw v4.0*

PC 486/50

Advanced Technology Center
(ATC) *MetaCheck R 2.10*
Software Publishing Corporation
(SPC) *Harvard Graphics v3.05*
Inset Systems *HiJaak Pro*
Lotus *Freelance v2.01*
Micrografx *Designer v4.0*
Corel *Ventura Publisher*

Standards
Tested:

MIL-D-28003

3. 1840A Analysis

3.1 External Packaging

The files arrived at the Air Force CALS Test Bed (AFCTB) via an electronic transfer to the internet server. No physical media was exchanged or evaluated.

3.2 Transmission Envelope

The files received by the AFCTB were not MIL-STD-1840A files. The files were not named per the standard conventions, as the stated purpose of the evaluation was the basic data structure.

3.2.1 Tape Formats

No tape was submitted for evaluation.

3.2.2 Declaration and Header Fields

The files were submitted for evaluation without the CALS headers or Document Declaration file. The purpose of the evaluation was the basic data files.

4. IGES Analysis

No Initial Graphics Exchange Specification (IGES) files were included in this evaluation.

5. SGML Analysis

No Standard Generalized Markup Language (SGML) files were include in this evaluation.

6. Raster Analysis

No Raster files were included in this evaluation.

7. CGM Analysis

Four CGM files were transmitted electronically to the AFCTB for evaluation. The files consisted of two sets, which were the same except for the specifications used. Two of the files were submitted using the CALS MIL-D-28003 specification and the other two were submitted using a basic ANSI specification.

The four files were evaluated using ATC's *MetaCheck* software. The CALS files were tested using the CALS options while the ANSI files were not. All four files were reported without error using the tested specification.

The CGM files were evaluated using the beta AFCTN *validcgm* utility. This utility only tests for CALS requirements, therefore, when an attempt was made to test the ANSI CGM files with this utility, it reported errors. Other discrepancies were reported in all files.

The AFCTB has several tools for viewing CGM files. These tools are not used to generate a pass/fail but to report how commercially available software can handle the files. Many of these products are used in the development of technical publications and are good indicators of usability. The use of these products is not an endorsement nor an indication of CALS capability. All operations were performed using the default settings.

The CGM files were converted using ArobrText's *cgm2draw* utility without a reported error. The resulting files were read into Island Graphics' *IslandDraw* v3.1, displayed and printed. The displayed and printed images appeared to be complete with no errors noted.

The files were read into Carberry's *CADLeaf* software and displayed without a reported error. The displayed and printed images appeared to be complete.

The files were viewed using a software available within the AFCTB. All four files were imported without a reported error. The images displayed and printed without a problem.

The files were imported into Micrografx's *Designer* without a reported error. When initially displayed, the images were a black block. The color option was used changing the background to white to correct this problem. The displayed and printed images appear to be complete with no noted errors.

The files were imported into Lotus' *Freelance* without a reported error. The images displayed and printed without a problem. The images appear to be complete with no noted discrepancies.

The files were imported into SPC's *Harvard Graphics v3.05* with a reported bad color error. When displayed the image was completely black. The image was ungrouped and the background color removed. This background color had to be deleted twice in order for the file to display and print correctly.

The files were read into Inset Systems' *HiJaak Pro* without a reported error. However, the displayed image was a black box. It was not possible to change the color to display the images. *HiJaak Pro* was able to read in the PGL file format generated by another software available within the AFCTB, which it displayed and printed without a problem.

According to Beverly Bernard of Inset Systems, "HiJaak Pro Shipstream has corrected the display problem you cite in this report. Current shipping versions will display properly and any user with an older version of HiJaak Pro who needs the Shipstream need only to contact Inset Systems for the update."

The files were imported directly into Island Graphics' *IslandDraw v4.0* without a reported error. When the images were displayed only part was visible. Changing the background color still would not permit the image to display. When the image was ungrouped and all entities were selected, they still did not display.

The files were imported into Corel's *Ventura Publisher* without a reported error. The images displayed and printed without a problem. No discrepancies were noted.

The CALS CGM files meet the CALS MIL-D-28003 specification.
The ANSI CGM files meet the ANSI specification. Several of
the software applications within the AFCTB had problems with
the background color in the files. .

8. Conclusions and Recommendations

The stated purpose of this test was to evaluate CGM files from a new ITI translator. The files were not submitted in an 1840A format and were not evaluated against this standard.

The four CGM files submitted by International TechneGroup Incorporated meet the CALS MIL-D-28003 specification, and the ANSI CGM specification. However, several software applications had problems with the background color which required changing or removal.

9. Appendix A - Detailed CGM Analysis

9.1 File ITIMECH.CAL

9.1.1 Parser Log MetaCheck

MetaCheck Version 2.10 -- CGM/MIL-D-28003 Conformance Analyzer
Copyright 1988-93 CGM Technology Software
Execution Date: 02/15/94 Time: 10:32:32

Metafile Examined : i:\94005\itimech.cal

Pictures Examined : All
Elements Examined : All
Bytes Examined : All

===== Trace Report =====

Tracing not selected.

===== CGM Conformance Violation Report =====

No Errors Detected

===== CALS CGM Profile (MIL-D-28003) Report =====

No profile discrepancies detected.

===== Conformance Summary Report =====

MetaCheck Version 2.10 -- CGM/MIL-D-28003 Conformance Analyzer
Copyright 1988-93 CGM Technology Software
Execution Date: 02/15/94 Time: 10:33:03

Name of CGM under test: i:\94005\itimech.cal
Encoding : Binary

Pictures Examined : All
Elements Examined : All
Bytes Examined : All

BEGIN METAFILE string : >iw_plot.1709.cal<
METAFILE DESCRIPTION : >igesworks MIL-D-28003/BASIC-1<

Picture 1 starts at octet offset 206: >PIC1<

Conformance Summary : This file conforms to the CGM specification.
This file meets the CALS CGM Profile (MIL-D-28003).

Summary of Testing Performed and Errors Found:

1 Pictures Tested
9456 Elements Tested
212716 Octets Tested

```
=====
|   No Errors Were Detected   |
=====
```

===== End of Conformance Report =====

9.1.2 validcgm Log

Analysis for file itimechc.cgm using table table

ERROR: illegal in this state (2), std B

ERROR: required precursor (0, 3) not yet seen

(6.1, 0) (2, 6, 8) VDC Extent (0, 0) (31978, 25582)

(0, 1) occurred 1 time
(0, 2) occurred 1 time
(0, 3) occurred 1 time
(0, 4) occurred 1 time
(0, 5) occurred 1 time
(1, 1) occurred 1 time
(1, 2) occurred 1 time
(1, 3) occurred 1 time
(1, 9) occurred 1 time
(1, 11) occurred 1 time
(1, 12) occurred 1 time
(2, 2) occurred 1 time
(2, 3) occurred 1 time
(2, 4) occurred 1 time
(2, 6) occurred 1 time
(2, 6) occurred illegally 1 time
(2, 7) never occurred, required by standard B
(3, 5) occurred 1345 times
(3, 6) occurred 1 time
(4, 1) occurred 6034 times
(4, 7) occurred 1797 times
(4, 11) occurred 2 times
(4, 17) occurred 26 times
(5, 2) occurred 53 times
(5, 3) occurred 152 times
(5, 4) occurred 2 times
(5, 22) occurred 27 times
(5, 23) occurred 2 times
(5, 34) occurred 1 time

9.1.3 Output cgm2draw/IslandDraw



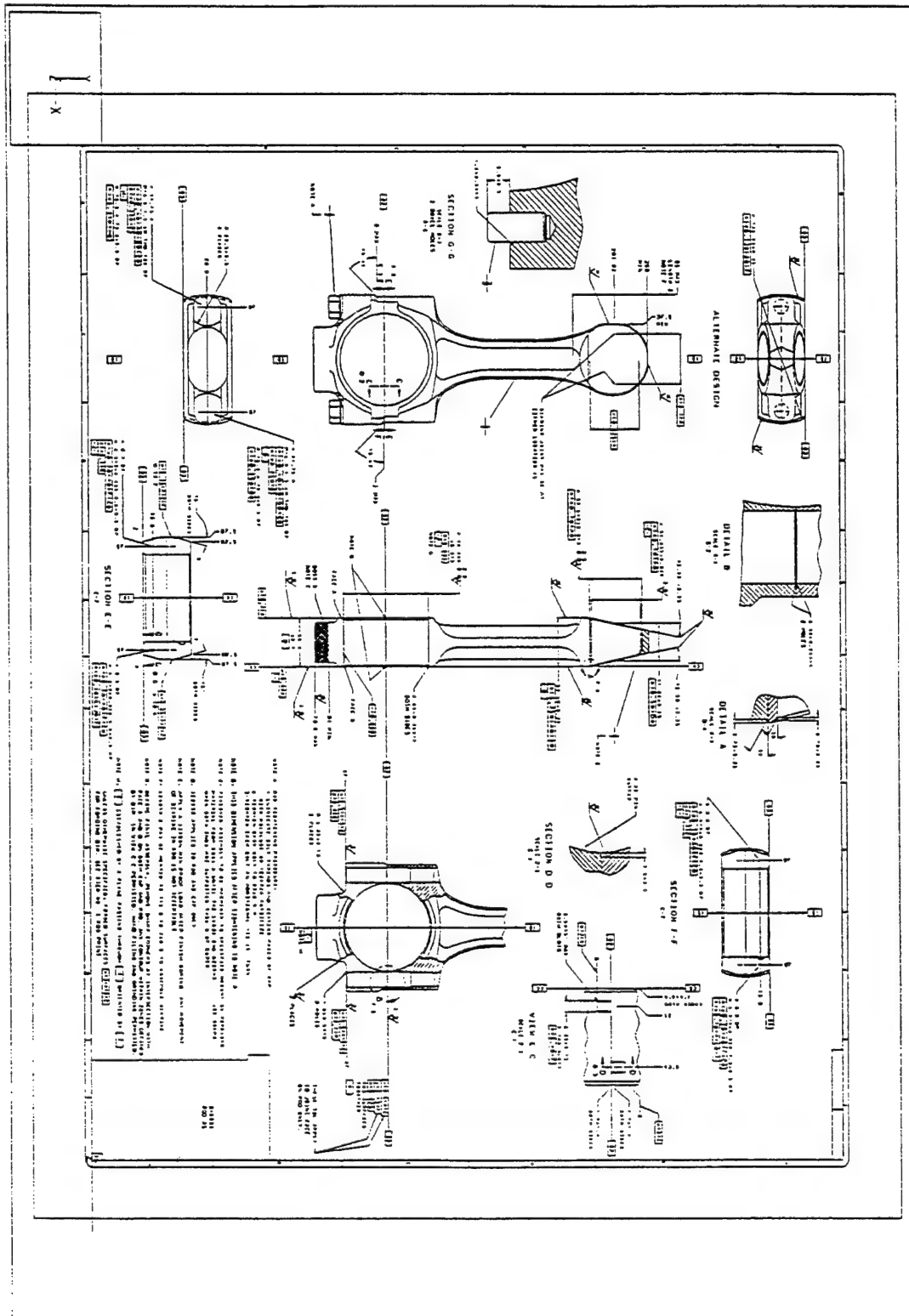
Technical drawing of a propeller assembly, showing various views and sections. The drawing includes the following components:

- ALTERNATE DESIGN:** A top view of the propeller hub showing dimensions and a note about the bearing joint.
- DETAIL A:** A cross-sectional view of the propeller tip, showing dimensions and a note about the bearing joint.
- DETAIL B:** A cross-sectional view of the propeller hub, showing dimensions and a note about the bearing joint.
- SECTION F-F:** A cross-sectional view of the propeller hub, showing dimensions and a note about the bearing joint.
- SECTION D-D:** A cross-sectional view of the propeller hub, showing dimensions and a note about the bearing joint.
- VIEW C-C:** A cross-sectional view of the propeller hub, showing dimensions and a note about the bearing joint.
- SECTION G-G:** A cross-sectional view of the propeller hub, showing dimensions and a note about the bearing joint.
- SECTION E-E:** A cross-sectional view of the propeller hub, showing dimensions and a note about the bearing joint.

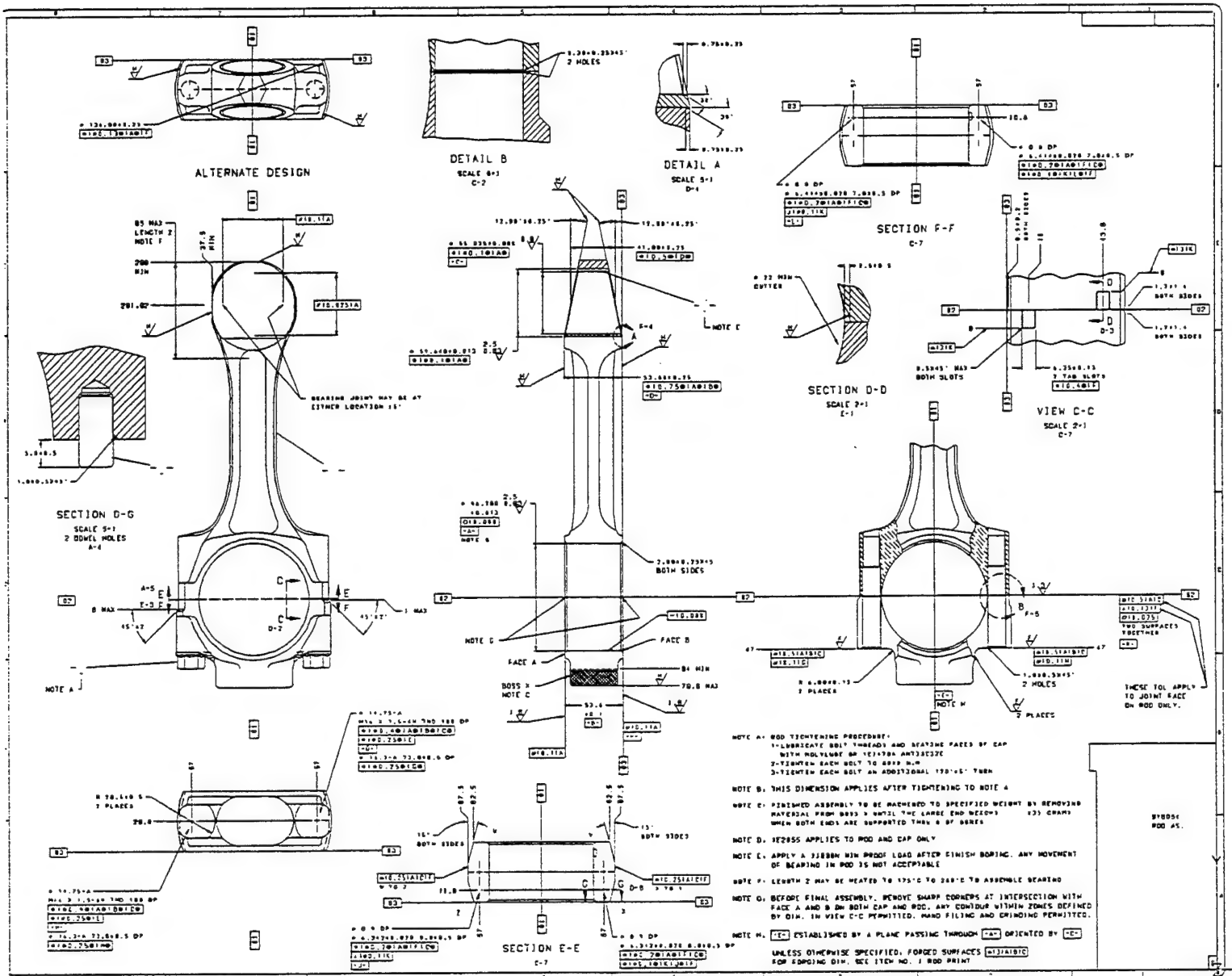
The drawing includes numerous dimensions and notes, such as:

- NOTE A:** DIMENSIONAL TOLERANCES SHALL BE AS SHOWN ON DRAWING.
- NOTE B:** THIS DIMENSION APPLIES AFTER TIGHTENING TO NOTE A.
- NOTE C:** BEFORE FINAL ASSEMBLY, REMOVE SHARP CORNERS AT INTERSECTION WITH FACE A AND B ON BOTH CAP AND HUB. ANY CONTOUR WITHIN DIMENSIONS SPECIFIED BY DIA. IN VIEW C-C PERMITTED. HAND FILING AND BRUISING PERMITTED.
- NOTE D:** ESTABLISHED BY A PLANE PASSING THROUGH THE CENTER OF THE HUB AND THE CENTER OF THE CAP.
- NOTE E:** UNLESS OTHERWISE SPECIFIED, FORMED SURFACES SHALL BE TO THE DIMENSIONS SHOWN.
- NOTE F:** DIMENSIONS SHOWN IN PARENTHESES ARE FOR INFORMATION ONLY.
- NOTE G:** DIMENSIONS SHOWN IN PARENTHESES ARE FOR INFORMATION ONLY.
- NOTE H:** DIMENSIONS SHOWN IN PARENTHESES ARE FOR INFORMATION ONLY.
- NOTE I:** DIMENSIONS SHOWN IN PARENTHESES ARE FOR INFORMATION ONLY.
- NOTE J:** DIMENSIONS SHOWN IN PARENTHESES ARE FOR INFORMATION ONLY.
- NOTE K:** DIMENSIONS SHOWN IN PARENTHESES ARE FOR INFORMATION ONLY.
- NOTE L:** DIMENSIONS SHOWN IN PARENTHESES ARE FOR INFORMATION ONLY.
- NOTE M:** DIMENSIONS SHOWN IN PARENTHESES ARE FOR INFORMATION ONLY.
- NOTE N:** DIMENSIONS SHOWN IN PARENTHESES ARE FOR INFORMATION ONLY.
- NOTE O:** DIMENSIONS SHOWN IN PARENTHESES ARE FOR INFORMATION ONLY.
- NOTE P:** DIMENSIONS SHOWN IN PARENTHESES ARE FOR INFORMATION ONLY.
- NOTE Q:** DIMENSIONS SHOWN IN PARENTHESES ARE FOR INFORMATION ONLY.
- NOTE R:** DIMENSIONS SHOWN IN PARENTHESES ARE FOR INFORMATION ONLY.
- NOTE S:** DIMENSIONS SHOWN IN PARENTHESES ARE FOR INFORMATION ONLY.
- NOTE T:** DIMENSIONS SHOWN IN PARENTHESES ARE FOR INFORMATION ONLY.
- NOTE U:** DIMENSIONS SHOWN IN PARENTHESES ARE FOR INFORMATION ONLY.
- NOTE V:** DIMENSIONS SHOWN IN PARENTHESES ARE FOR INFORMATION ONLY.
- NOTE W:** DIMENSIONS SHOWN IN PARENTHESES ARE FOR INFORMATION ONLY.
- NOTE X:** DIMENSIONS SHOWN IN PARENTHESES ARE FOR INFORMATION ONLY.
- NOTE Y:** DIMENSIONS SHOWN IN PARENTHESES ARE FOR INFORMATION ONLY.
- NOTE Z:** DIMENSIONS SHOWN IN PARENTHESES ARE FOR INFORMATION ONLY.

9.1.5 Output Generic



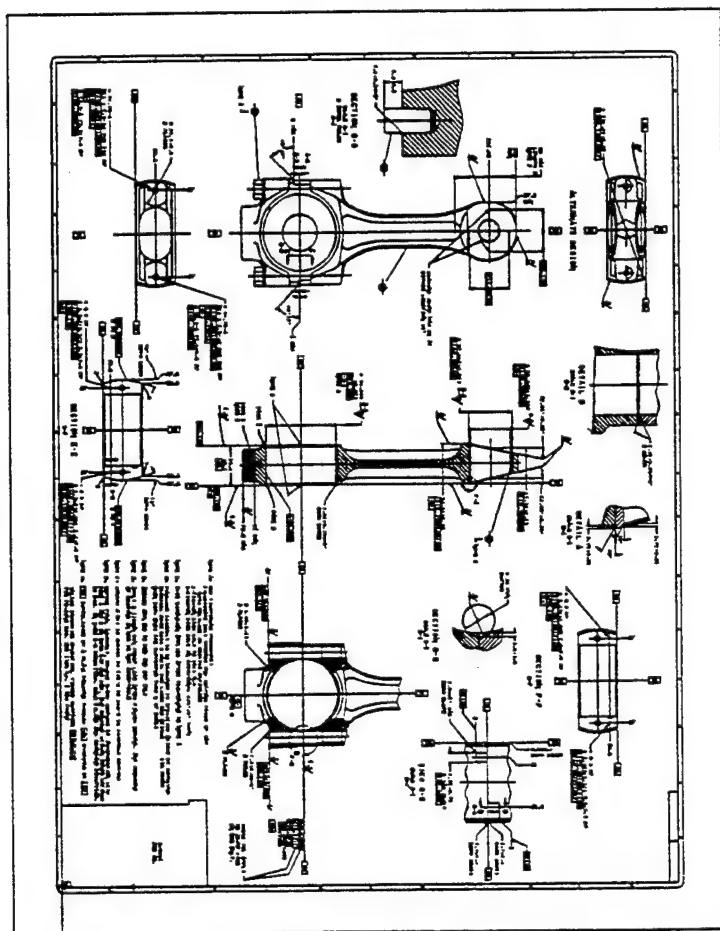
9.1.6 Output Designer



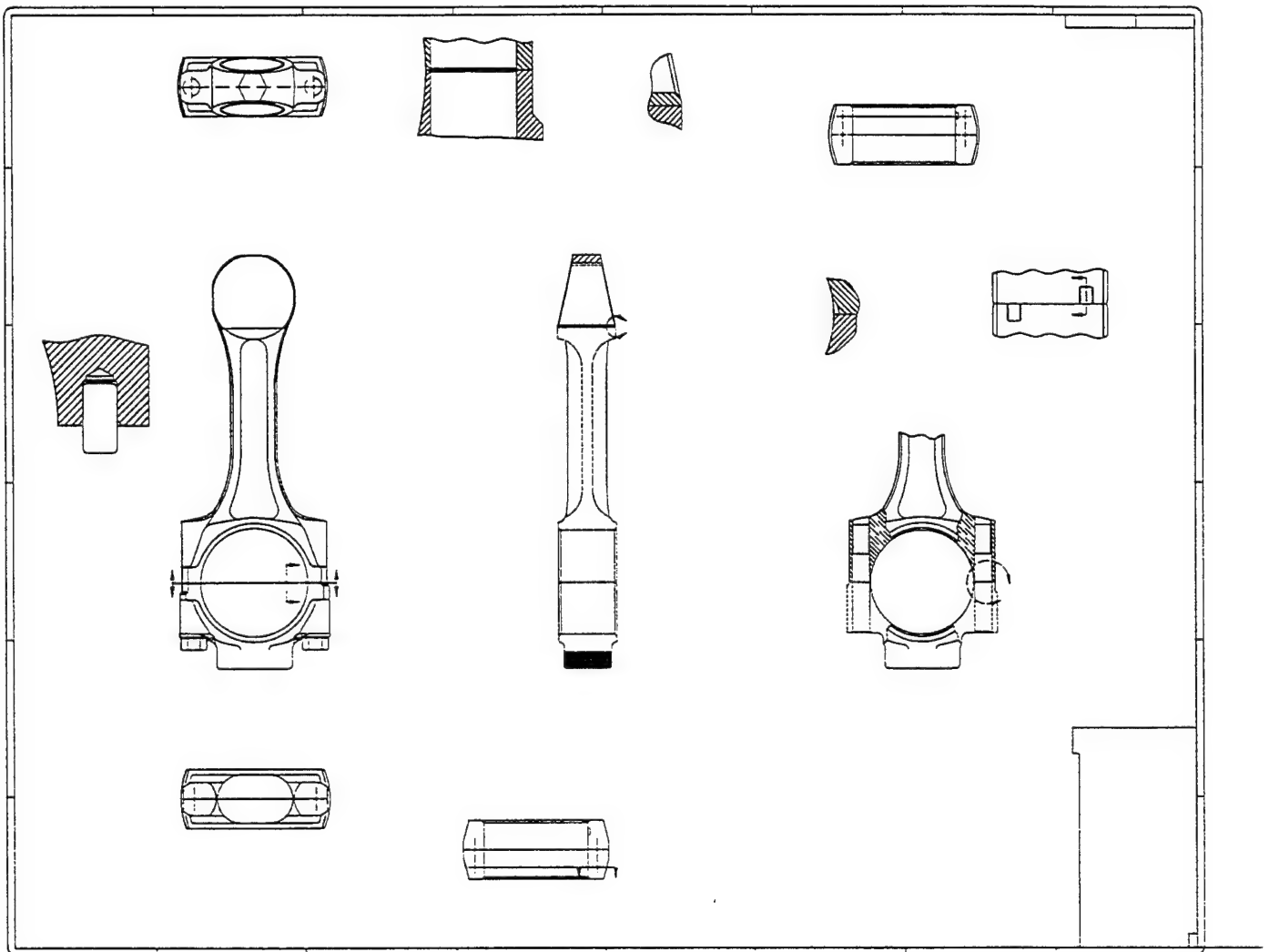
9.1.7 Output Freelance



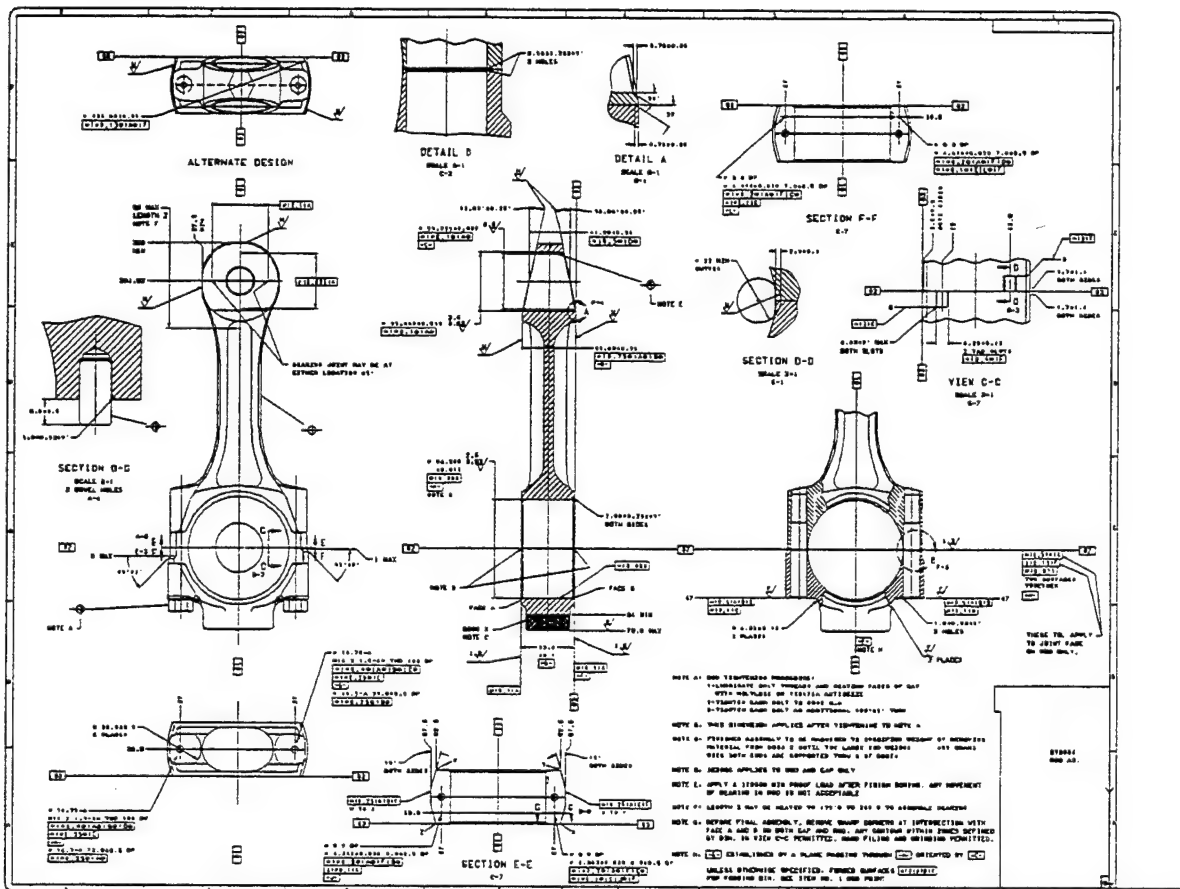
9.1.8 Output Harvard Graphics



9.1.9 Output IslandDraw v4.0



9.1.10 Output Ventura Publisher



9.2 File ITIMECH.ANS

9.2.1 Parser Log MetaCheck

MetaCheck Version 2.10 -- CGM Conformance Analyzer
Copyright 1988-93 CGM Technology Software
Execution Date: 02/15/94 Time: 11:30:57

Metafile Examined : i:\94005\itimech.ans

Pictures Examined : All

Elements Examined : All

Bytes Examined : All

===== Trace Report =====

Tracing not selected.

===== CGM Conformance Violation Report =====

No Errors Detected

===== Conformance Summary Report =====

MetaCheck Version 2.10 -- CGM Conformance Analyzer
Copyright 1988-93 CGM Technology Software
Execution Date: 02/15/94 Time: 11:31:28

Name of CGM under test: i:\94005\itimech.ans
Encoding : Binary

Pictures Examined : All

Elements Examined : All

Bytes Examined : All

BEGIN METAFILE string : >iw_plot.1709.ans<
METAFILE DESCRIPTION : >igesworks<

Picture 1 starts at octet offset 186: >PIC1<

Conformance Summary : This file conforms to the CGM specification.

Summary of Testing Performed and Errors Found:

1 Pictures Tested
9456 Elements Tested

212696 Octets Tested

```
=====
|   No Errors Were Detected   |
=====
```

===== End of Conformance Report =====

9.2.2 validcgm Log

Analysis for file itimech.cgm using table table
MILSPEC 28003 error: descriptor doesn't contain MIL-D-28003/BASIC-1
(3, 24) (1, 2, 10) Metafile Description "igesworks"
ERROR: illegal in this state (2), std B
ERROR: required precursor (0, 3) not yet seen
(6.1, 0) (2, 6, 8) VDC Extent (0, 0) (31978, 25582)
(0, 1) occurred 1 time
(0, 2) occurred 1 time
(0, 3) occurred 1 time
(0, 4) occurred 1 time
(0, 5) occurred 1 time
(1, 1) occurred 1 time
(1, 2) occurred 1 time
(1, 3) occurred 1 time
(1, 9) occurred 1 time
(1, 11) occurred 1 time
(1, 12) occurred 1 time
(2, 2) occurred 1 time
(2, 3) occurred 1 time
(2, 4) occurred 1 time
(2, 6) occurred 1 time
(2, 6) occurred illegally 1 time
(2, 7) never occurred, required by standard B
(3, 5) occurred 1345 times
(3, 6) occurred 1 time
(4, 1) occurred 6034 times
(4, 7) occurred 1797 times
(4, 11) occurred 2 times
(4, 17) occurred 26 times
(5, 2) occurred 53 times
(5, 3) occurred 152 times
(5, 4) occurred 2 times
(5, 22) occurred 27 times
(5, 23) occurred 2 times
(5, 34) occurred 1 time

9.3 File ITITORUS.CAL

9.3.1 Parser Log MetaCheck

MetaCheck Version 2.10 -- CGM/MIL-D-28003 Conformance Analyzer
Copyright 1988-93 CGM Technology Software
Execution Date: 02/15/94 Time: 10:34:51

Metafile Examined : i:\94005\ititorus.cal

Pictures Examined : All

Elements Examined : All

Bytes Examined : All

===== Trace Report =====

Tracing not selected.

===== CGM Conformance Violation Report =====

No Errors Detected

===== CALS CGM Profile (MIL-D-28003) Report =====

No profile discrepancies detected.

===== Conformance Summary Report =====

MetaCheck Version 2.10 -- CGM/MIL-D-28003 Conformance Analyzer
Copyright 1988-93 CGM Technology Software
Execution Date: 02/15/94 Time: 10:34:54

Name of CGM under test: i:\94005\ititorus.cal
Encoding : Binary

Pictures Examined : All

Elements Examined : All

Bytes Examined : All

BEGIN METAFILE string : >iw_plot.1709.cal<
METAFILE DESCRIPTION : >igesworks MIL-D-28003/BASIC-1<

Picture 1 starts at octet offset 206: >PIC1<

Conformance Summary : This file conforms to the CGM specification.
This file meets the CALS CGM Profile (MIL-D-28003).

Summary of Testing Performed and Errors Found:

1 Pictures Tested
119 Elements Tested
3128 Octets Tested

```
=====
|   No Errors Were Detected   |
=====
```

===== End of Conformance Report =====

9.3.2 validcgm Log

Analysis for file ititorusc.cgm using table table

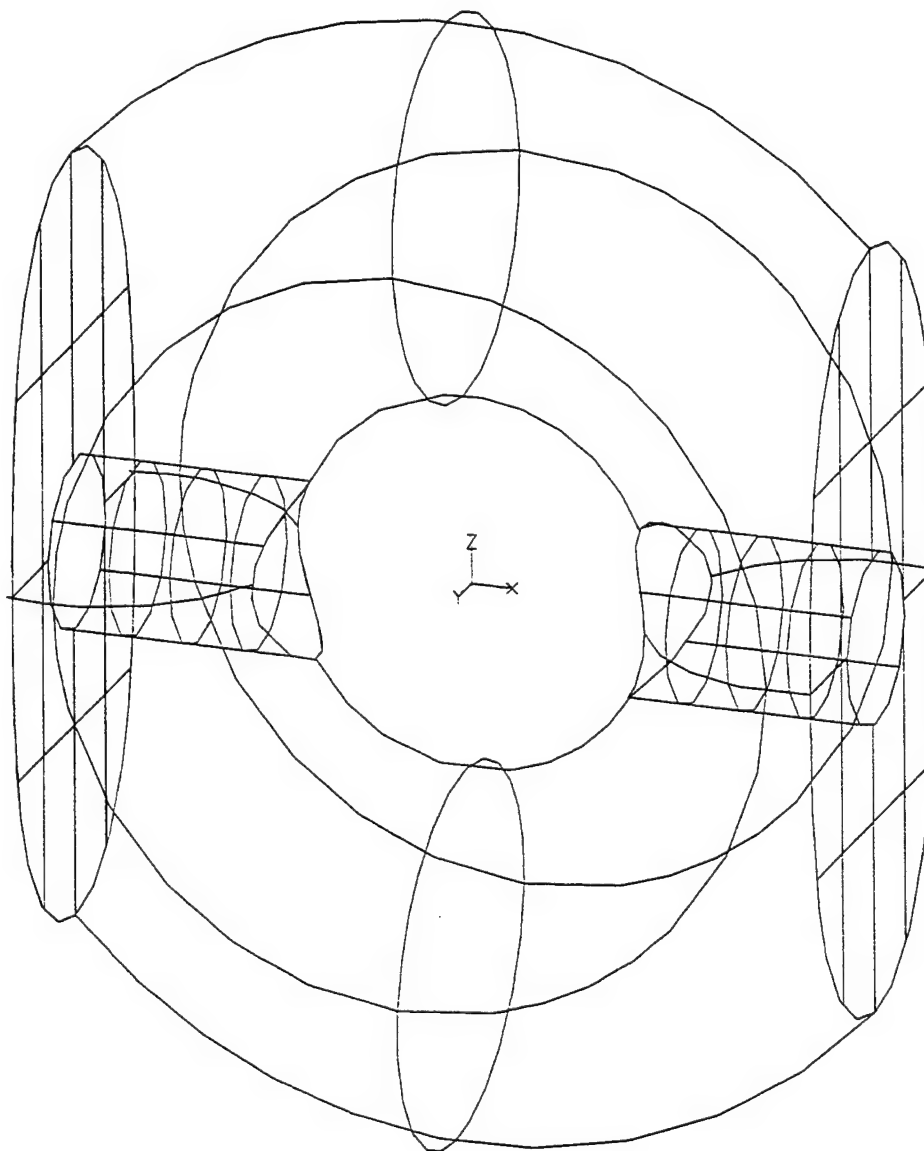
ERROR: illegal in this state (2), std B

ERROR: required precursor (0, 3) not yet seen

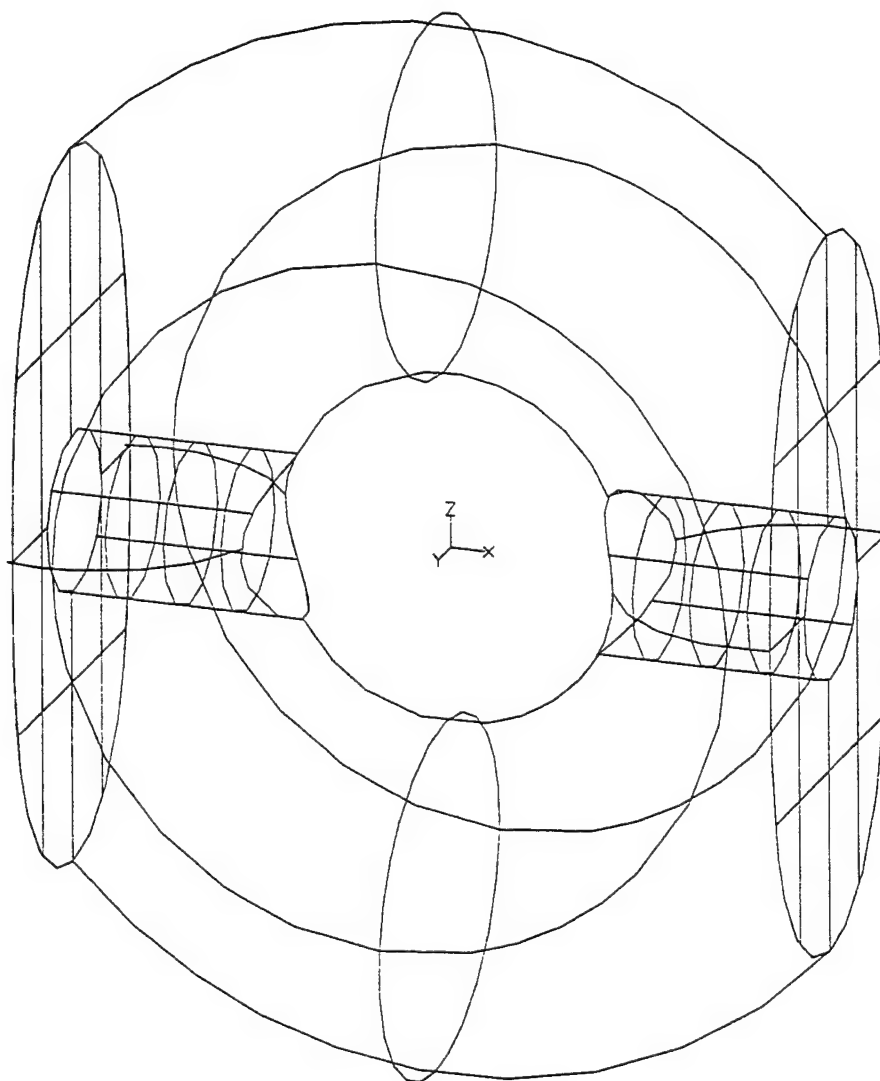
(6.1, 0) (2, 6, 8) VDC Extent (0, 0) (31978, 25582)

(0, 1) occurred 1 time
(0, 2) occurred 1 time
(0, 3) occurred 1 time
(0, 4) occurred 1 time
(0, 5) occurred 1 time
(1, 1) occurred 1 time
(1, 2) occurred 1 time
(1, 3) occurred 1 time
(1, 9) occurred 1 time
(1, 11) occurred 1 time
(1, 12) occurred 1 time
(2, 2) occurred 1 time
(2, 3) occurred 1 time
(2, 4) occurred 1 time
(2, 6) occurred 1 time
(2, 6) occurred illegally 1 time
(2, 7) never occurred, required by standard B
(3, 5) occurred 5 times
(3, 6) occurred 1 time
(4, 1) occurred 84 times
(4, 11) occurred 2 times
(5, 2) occurred 1 time
(5, 3) occurred 7 times
(5, 4) occurred 2 times
(5, 22) occurred 1 time
(5, 23) occurred 1 time
(5, 34) occurred 1 time

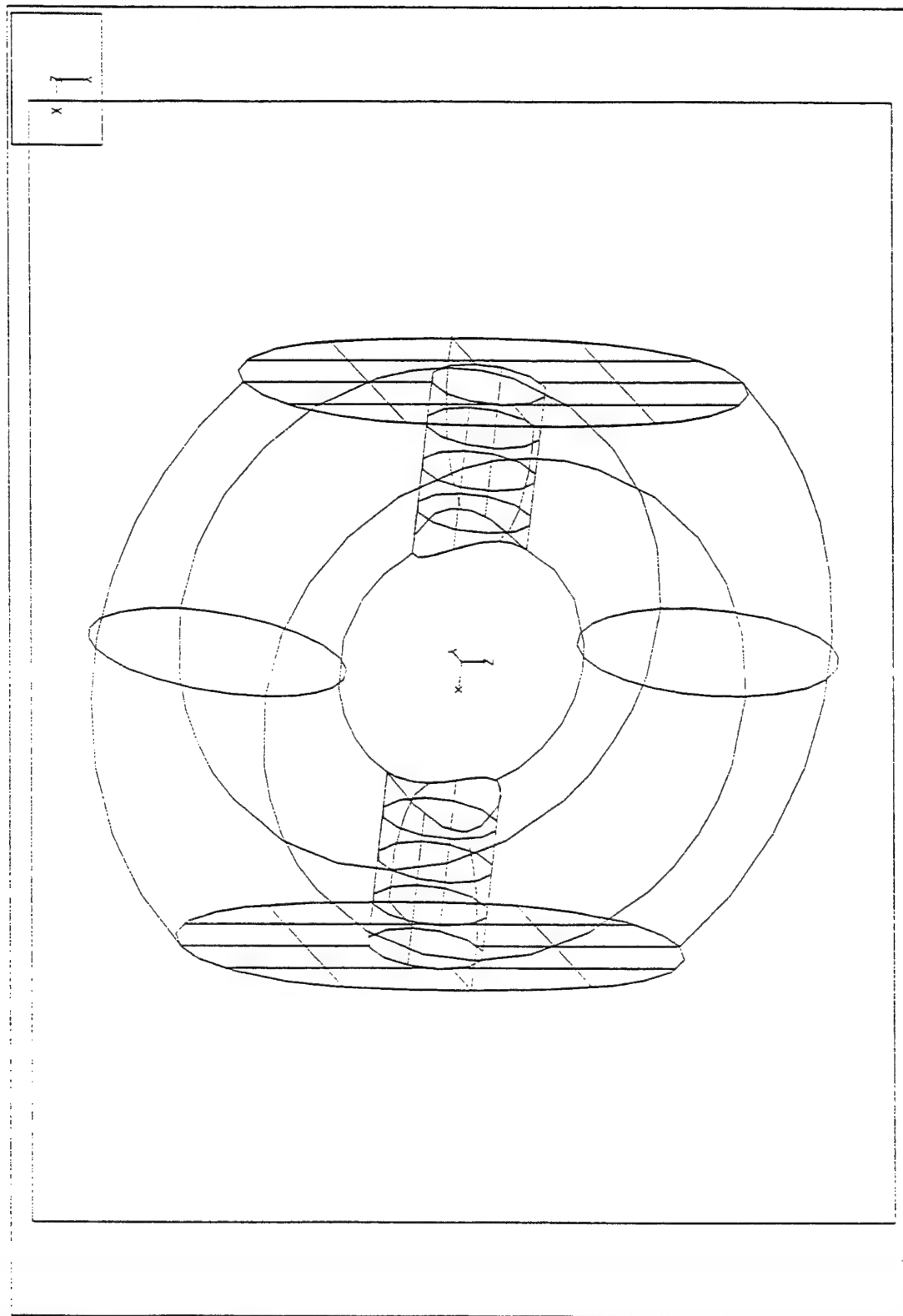
9.3.3 Output cgm2draw/IslandDraw



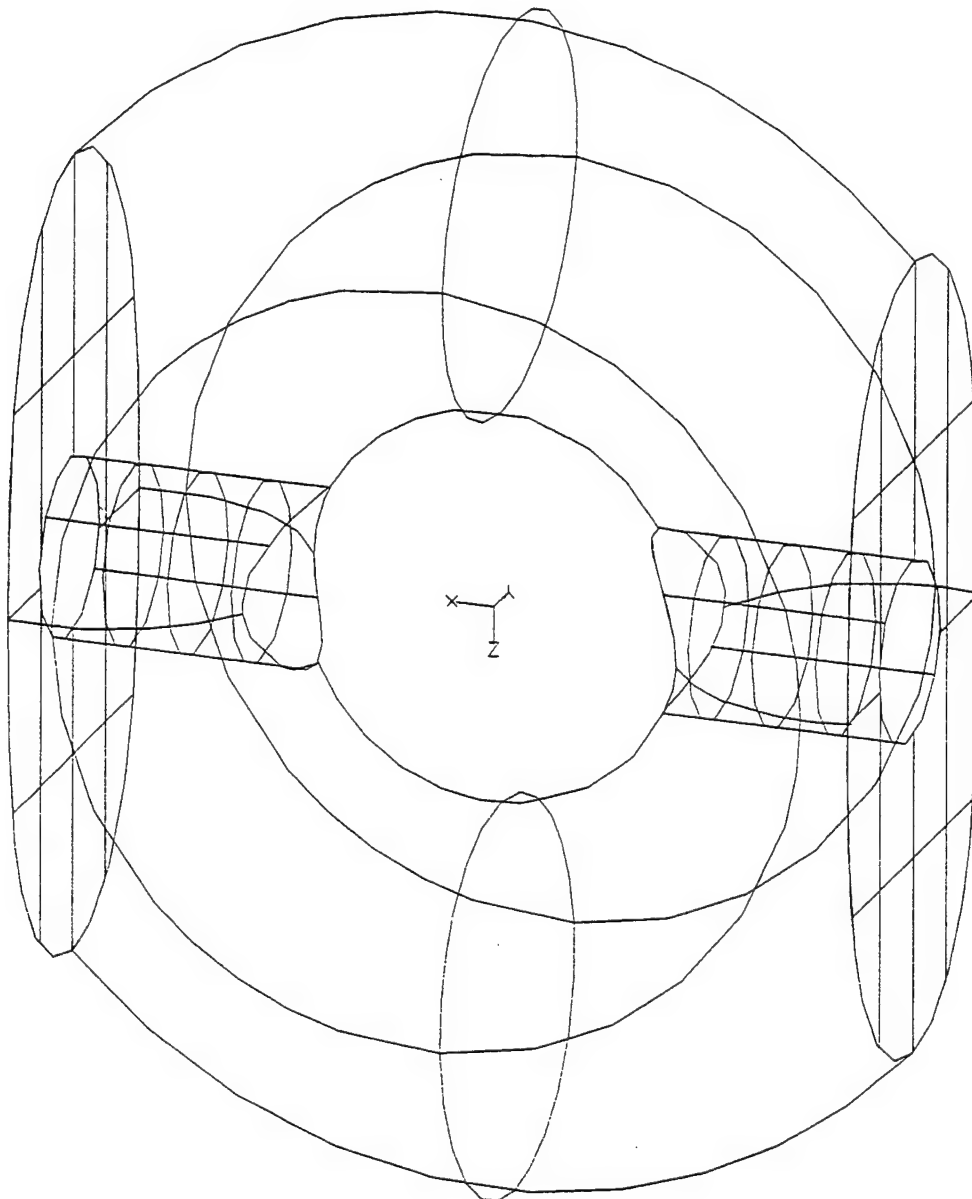
9.3.4 Output CADLeaf



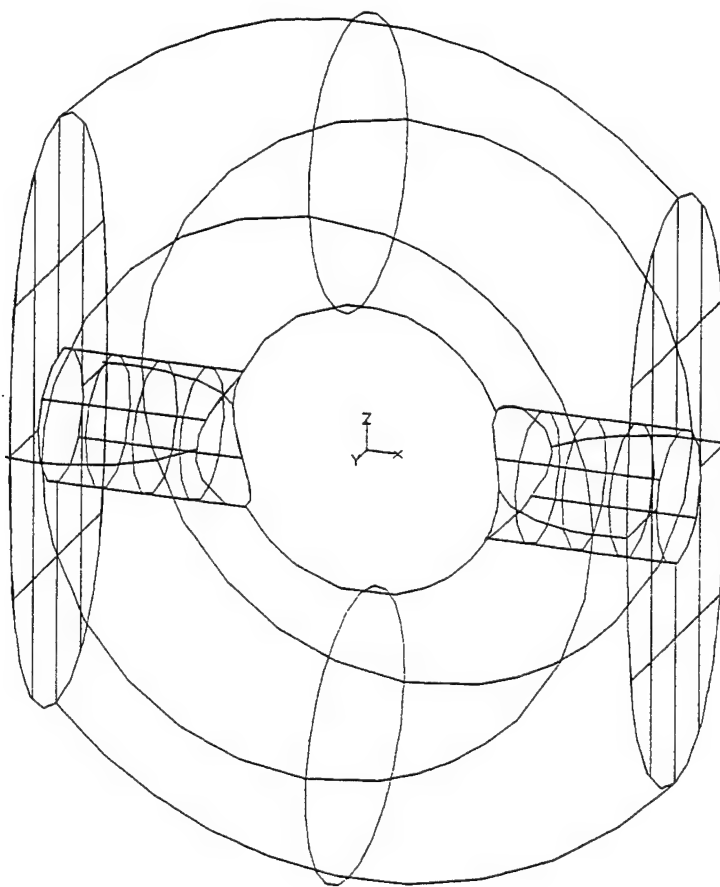
9.3.5 Output Generic



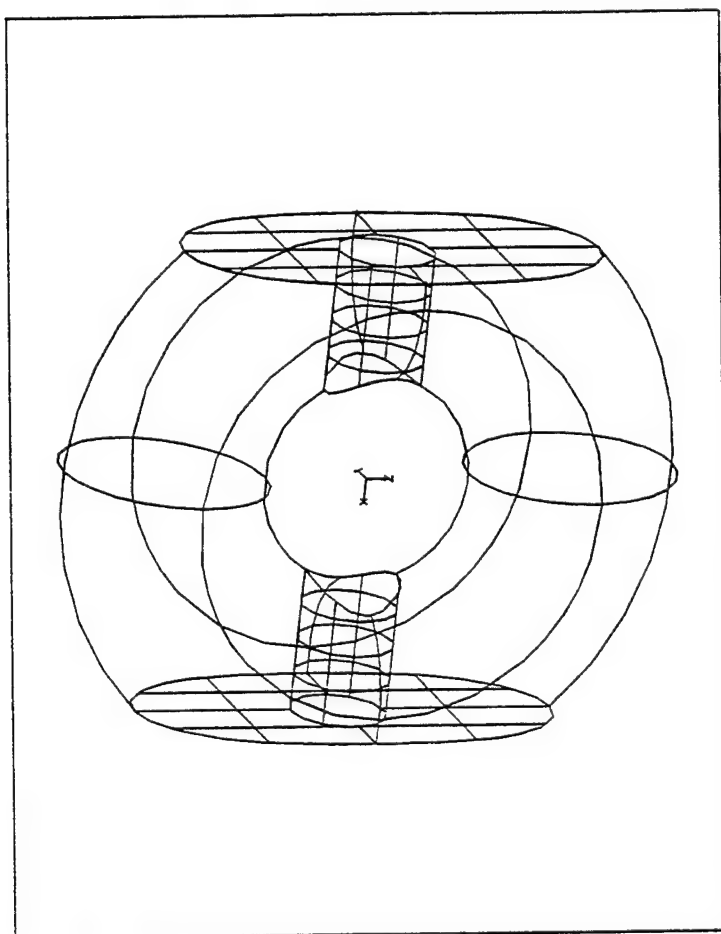
9.3.6 Output Designer



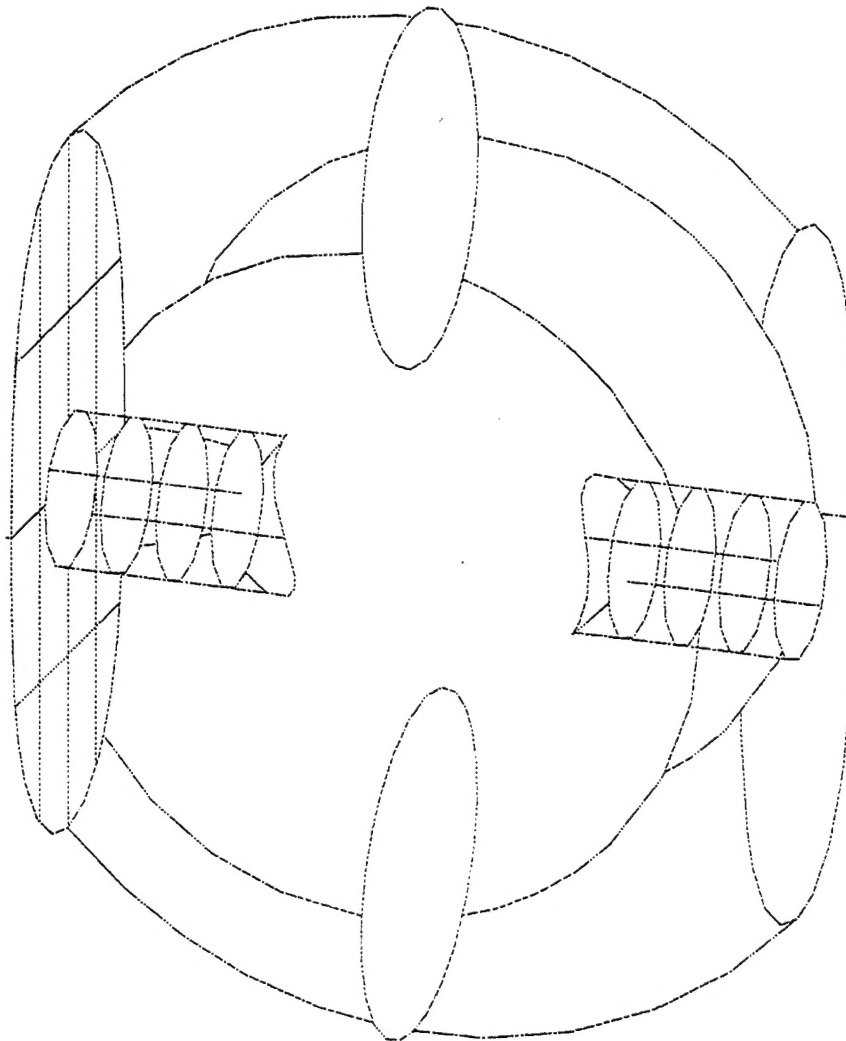
9.3.7 Output Freelance



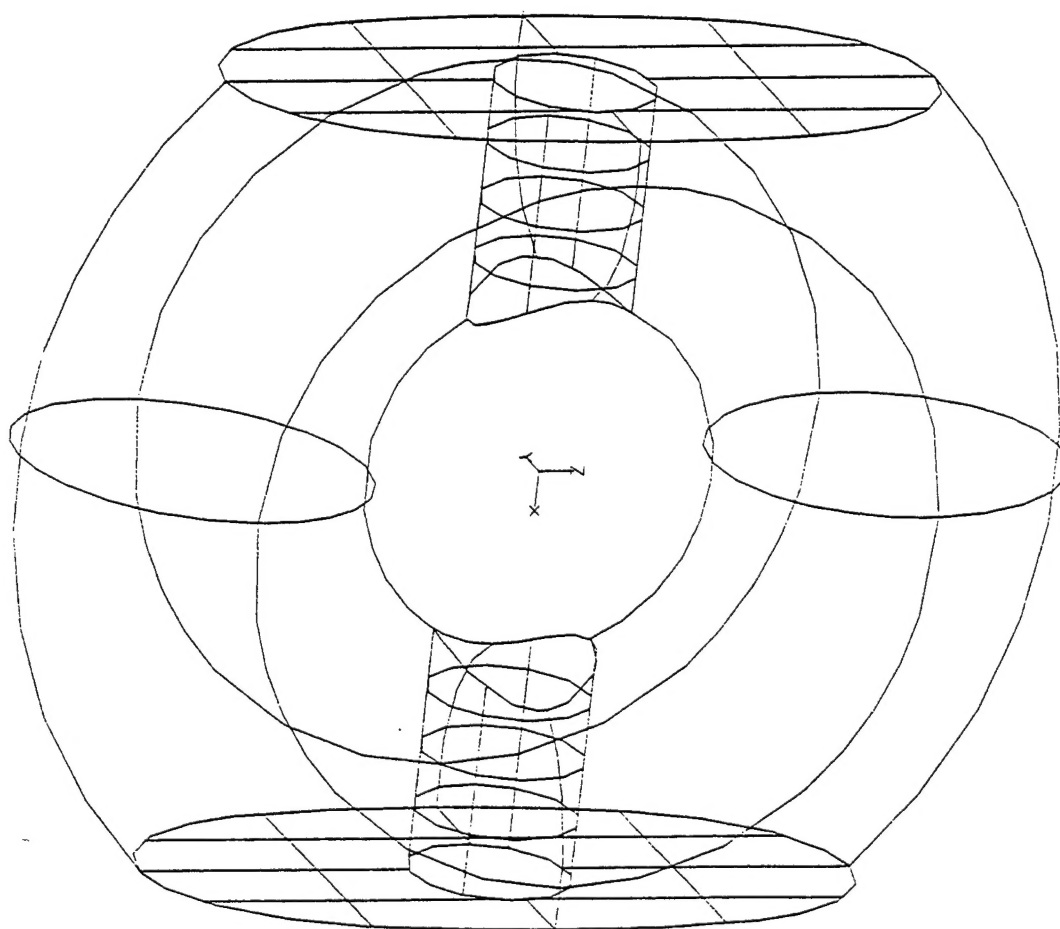
9.3.8 Output Harvard Graphics



9.3.9 Output IslandDraw v4.0



9.3.10 Output Ventura Publisher



9.4 File ITITORUS.ANS

9.4.1 Parser Log MetaCheck

MetaCheck Version 2.10 -- CGM Conformance Analyzer
Copyright 1988-93 CGM Technology Software
Execution Date: 02/15/94 Time: 10:34:27

Metafile Examined : i:\94005\ititorus.ans

Pictures Examined : All
Elements Examined : All
Bytes Examined : All

===== Trace Report =====

Tracing not selected.

===== CGM Conformance Violation Report =====

No Errors Detected

===== Conformance Summary Report =====

MetaCheck Version 2.10 -- CGM Conformance Analyzer
Copyright 1988-93 CGM Technology Software
Execution Date: 02/15/94 Time: 10:34:29

Name of CGM under test: i:\94005\ititorus.ans
Encoding : Binary

Pictures Examined : All
Elements Examined : All
Bytes Examined : All

BEGIN METAFILE string : >iw_plot.1709.ans<
METAFILE DESCRIPTION : >igesworks<

Picture 1 starts at octet offset 186: >PIC1<

Conformance Summary : This file conforms to the CGM specification.

Summary of Testing Performed and Errors Found:

1 Pictures Tested
119 Elements Tested

3108 Octets Tested

```
=====
|   No Errors Were Detected   |
=====
```

===== End of Conformance Report =====

9.4.2 validcgm Log

Analysis for file ititorus.cgm using table table

MILSPEC 28003 error: descriptor doesn't contain MIL-D-28003/BASIC-1

(3, 24) (1, 2, 10) Metafile Description "igesworks"

ERROR: illegal in this state (2), std B

ERROR: required precursor (0, 3) not yet seen

(6.1, 0) (2, 6, 8) VDC Extent (0, 0) (31978, 25582)

(0, 1) occurred 1 time

(0, 2) occurred 1 time

(0, 3) occurred 1 time

(0, 4) occurred 1 time

(0, 5) occurred 1 time

(1, 1) occurred 1 time

(1, 2) occurred 1 time

(1, 3) occurred 1 time

(1, 9) occurred 1 time

(1, 11) occurred 1 time

(1, 12) occurred 1 time

(2, 2) occurred 1 time

(2, 3) occurred 1 time

(2, 4) occurred 1 time

(2, 6) occurred 1 time

(2, 6) occurred illegally 1 time

(2, 7) never occurred, required by standard B

(3, 5) occurred 5 times

(3, 6) occurred 1 time

(4, 1) occurred 84 times

(4, 11) occurred 2 times

(5, 2) occurred 1 time

(5, 3) occurred 7 times

(5, 4) occurred 2 times

(5, 22) occurred 1 time

(5, 23) occurred 1 time

(5, 34) occurred 1 time